

STILES (R.C.)

*The life and doctrines
of Haller xxxxx*

SURGEON GENERAL
LIBRARY
alph: box.

Alphabet box

THE
LIFE AND DOCTRINES
OF
HALLER.

THE AMERICAN

HAIR

THE AMERICAN

THE AMERICAN

THE AMERICAN

THE AMERICAN

Prox

THE
LIFE AND DOCTRINES
OF
HALLER.

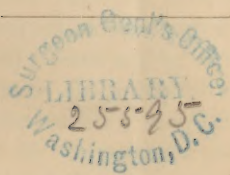
AN ANNIVERSARY ADDRESS

BEFORE THE

KINGS COUNTY MEDICAL SOCIETY,

BY

R. CRESSON STILES, M. D.



NEW YORK:
PRINTED BY C. A. ALVORD,
15 VANDEWATER STREET.
1867.

ADDRESS.

MR. PRESIDENT AND GENTLEMEN :—

AWARE of the long existence, in the history of our organization, of the custom, the observance of which finds me before you to-night, and mindful of the honorable example of my predecessors in office; charged with the vindication of the old rights and sound principles of Rational Medicine in the midst of a community of such rapid accretion, that it is in greater danger than others of firmer stability, of giving to false science a position and importance to which it is not entitled; in a commonwealth whose laws, in the name of the most perfect freedom, protect even the grossest empiricism in depredating upon the lives and health of simple and unwary citizens; and, at a time when the profession is the object of unusually virulent animadversion, how shall I best fulfill, although at best unworthily, the duty of the hour? Not by laudation of ourselves, nor crimination, however just, of our opponents; not by scientific abstractions, nor yet by unscientific and unauthoritative arguments; but by appeals to pure and lofty example; to such example as is truly worthy of admiration, and, as far as possible, of imitation.

From the bed-side of suffering, and round of hospital and clinique; from the inspection of haunts of disease (a duty at length fully recognized); from poring over symptoms and remedies, anxious possibilities and probabilities of life and death, we must all turn with pleasurable anticipation to mark the career of one of the heroes of our science, and review his character, deeds, and influence, where the character is one of exalted worth; where the deeds surpass almost the possibilities of mental activity; and where, above all, we may draw from the example afforded useful lessons for our own guidance, and inspire respect and affection for the calling which we represent.

I ask your attention, therefore, while I dwell upon the life and teachings of Albert Haller, Anatomist, Physiologist, Botanist, Poet, Legislator, Philosopher, the accomplished Physician, and distinguished Teacher of Medicine. I have not sought a theme which might afford attractions of romance, of striking vicissitudes of fortune, of fierce contests and brilliant victories; but rather of zeal for truth, of unwearying industry, and of Christian integrity, guiding a life of honor, culminating in the loftiest fame. I would take for my endeavor Haller's own chosen device, that of a mariner's compass with the motto—" *Error non abstulit fidem*" —(trust in spite of aberration),—and ask your indulgence for the manner in which my design has been fulfilled amid the labors of public service and of professional occupation. The theme, although of special interest to us as physicians, will not, I trust, prove unwelcome to our guests.

Lord Bacon, in his *Organum*, treats of three kinds of ambition—"First, that of men who are anxious to enlarge their own power in their country, which is a vulgar and degenerate kind; next, that of men who strive to enlarge the power and empire of their country over mankind, which is more dignified, but not less covetous; but if one were to endeavor to renew and enlarge the power and empire of mankind in general over the universe, such ambition (if it may be so termed) is both more sound and more noble than the other two." Eminent in the last of the three classes of men here designated, is the great man whose history we are about to study.

Although Haller has been called the "Father of Physiology," —(the science of life-action),—because, finding its study in bad repute among men of sound learning, on account of the mass of whimsicalities and absurdities which encumbered its few solid acquisitions, he resolved to lift it out of its degradation and set its basis upon observation and experiment, and, as far as lay in the power of a single mind, nobly accomplished his purpose, leaving in the "*Elementa Physiologiæ*" the model and foundation of all future advancement in his favorite science, in spite of this, his works are little known; but few libraries in the country contain any of the more elaborate of his voluminous endowments of medicine, as I infer from the result of my own researches; the physiologists of the present day too often pass him by without mention; his greatest works have never been translated from the ori-

ginal Latin. Although his influence is fairly acknowledged in shaping the method and direction of physiological inquiry, his authority is not sought on specific questions in proportion to its worth.

No man is what he is by accident or chance. An inherited organization is molded by surrounding physical, mental, and moral influences into a corresponding character. The problem is an intricate one, and very often baffles solution when we seek to trace each factor of character, among other factors, into its legitimate product in the individual constitution, but it is a study well worth the pursuit.

Haller was born at Berne, in Switzerland, in 1708. With the very name of his native land our boyhood has been taught heroic associations. The city of his nativity is situated on a lofty promontory, nearly surrounded by the river Aar, and is the capital of the Canton of the same name, long the most powerful of the Swiss confederation, and of the confederacy itself. The following description truly characterizes the impression which it makes upon the traveler among Europe's ancient cities:—

"It is a republic, yet it looks kingly. Something of a Roman majesty appears in its lofty terraces, in those massy arches on each side of the streets, in the abundance of water flowing night and day into gigantic basins, in the magnificent avenues of trees. The very silence and absence of bustle, a certain stateliness and reserved demeanor in the inhabitants, by showing it not to be a money-making town, implies that its wealth springs from more solid and permanent sources than trade can afford, and that another spirit animates its inhabitants. Luxury at Berne seems wholly directed to objects of public utility; by the side of those gigantic terraces, of those fine fountains and noble shades, you see none but simple and solid dwellings, yet scarcely any beggarly ones." * * "Zurich suggests the idea of a municipal aristocracy; Berne, of a warlike one; there we think we see citizens of a town transformed into nobility; here, nobles who have made themselves citizens."

And how shall we measure the influence upon a sensitive organization of the grandeur and beauty of nature in that favored region! From the walls of Berne the valley of the Aar stretched towards the mountains, inclosing the beautiful lakes of Thun and Brienz, and terminated by the giant peaks of the Bernese Oberland. Scenes which the tourist paints in his most glowing colors,

and treasures in his memory for a life-long delight, were Haller's familiar haunts. Here, where Nature reveals herself in such "forms of majesty divine," can we wonder that she should find devout worshipers and an unbroken succession of high-priests, from Conrad Gesner to Agassiz? Lofty impulse, noble daring, bright example, simple dignity, and conscious superiority, none of these were wanting to our poet and interpreter of Nature.

Haller was the youngest of four children; of a frail, delicate, and even diseased constitution. His father, Nicholas de Haller, advocate and chancellor of the county of Baden, was religious, stern, and laborious, but possessed no literary taste or distinction. Albert's strong literary bias was not favored either by near example or local influence. The republic prized military, legislative, and executive ability; its tastes were stern, simple, and pure. Haller affords, however, a most remarkable example of precocious literary development. Driven into retirement by inability to cope with the rugged health of those who should have been his playmates; debarred from physical recreation; and finding in his father's library abundant material to occupy his secluded existence, we hear of such wonderful results, as the composition of a Chaldaic Grammar and of a Biographical Dictionary by a boy of nine years.

His father had placed him under a stern instructor, Abraham Baillodz by name, whose chief merits were those of a devout Calvinist and a refugee from religious persecution, whose harshness made the life of young Haller miserable. But fortunately that very sensitiveness and delicacy of organization which aggravated his misery saved him from hatred of religion itself in the person of his tormentor; in his composition "the elements were kindlier mixed." The only revenge possible for him was in satires which, at the age of ten years, he rained on the head of his persecutor. His father was training him for the church; but his death, which occurred when the boy was but thirteen years old, left him free to follow the already eager bent of his mind for natural science, and he at once fixed upon the profession of medicine as most akin to his chosen pursuits. For a while after his father's death he attended a public school in Berne, where he signalized himself by passing the required examination long before the age prescribed, and by presenting in Greek the theme for final examination, which

was required only in Latin. As if, in precocious manhood, he had assumed for himself the direction of his career, the next year we find him pursuing the study of medicine at Bienne, under Doctor Neuhaus, the father of one of his young companions, employing his leisure in delving into the philosophy of Descartes and in writing poetry. At a fire, which occurred in the house in which he lived at Bienne, the boy exposed himself to great danger in rescuing his precious literary treasures from the flames; but he afterwards manifested his goodness of heart, as well as maturer judgment, in destroying the satires and poetical compositions which he had saved at such peril.

The same year he entered upon the study of medicine at Tübingen under Duvernoy and Camerarius. But Tübingen could not long satisfy his youthful ardor. The fame of Leyden, and the reputation of Boerhaave, Albinus, and Ruysch, carried the day over his love of home. There were heights of science to be climbed from the watery plains of Holland brighter to youthful ambition than the glow of his snow-capped mountains.

Here the clearness, candor, and unaffected eloquence of Boerhaave sank deep into his heart, of whom he says: "Some, though few, will rival him in erudition; his divine temper, kind to all, beneficent to foes and adversaries, detracting from no man's merits, and binding by favors his daily opponents, may, perhaps, never be paralleled." Here was the great cabinet of Ruysch, where, says Vicq-d'Azqr: "Among so many organs wonderfully prepared, amid cadavers which had recovered, as it were, a new life, he saw a shriveled old man of ninety winters, but still laborious and active, who seemed, like an enchanter among his wonderful preparations, to have united to the secret of preserving them that of rendering himself immortal." Albinus, on the contrary, was in the early dawn of his fame. Here we must imagine him pursuing the career, so devoid of classic and crystalline glitter in the eyes of the world, but so full of the glow of life, of a student of medicine; occupied with lectures, dissections, cliniques; distinguished among his fellows by his frail and youthful appearance; a brighter eye, a quicker comprehension, a readier memory, a more untiring ardor; plying his masters with eager questioning, perhaps favored by them in secret above his fellows; but of this portion of his life the record is meagre.

Having completed the prescribed course of study at Leyden, he

returned to Tübingen to graduate, actuated probably by the same motives which led Linnæus and Boerhaave to take their doctor's degree at Harderwyck. His thesis (for at that time a thesis was not the meaningless formality into which it has now degenerated) proclaimed him a thorough anatomist and a profound scholar. After graduation he embarked a large share of his small patrimony in a foreign tour, in visiting the schools of other lands, and in completing his studies under the advantages thus secured. His delicate health was severely threatened by unremitting activity in study; he hoped from his travels its complete restoration.

In London he was the recipient of the distinguished attentions of Hans Sloane, Douglas, and Cheselden. At Paris he sought the instruction of Geoffrey, the Jussieus, Petit, Ledran, and Winslow, of the last of whom he called himself the pupil. At Paris, a body on which he was prosecuting his anatomical researches having attracted, by its offensiveness, the attention of the neighbors, information was lodged against him, and he fled in haste, fearful of the galleys. Even at the center of scientific authority he sought in nature the soundest instruction and highest authority of all. A refugee from Paris, he planned a visit to the renowned schools of Italy, Padua, Bologna, and Pisa, but ill health conspired with a slender purse to thwart his projects, and he returned to Switzerland, seeking in his own mountain air a tonic for the body, and in the study of the mathematics, under Bernouilli, at Basle, a corroborant for his enthusiastic and poetic temperament. While at Basle he occupied for a season the chair of anatomy, while Dr. Mieg, the incumbent, was prostrated by an attack of sickness, and gave an earnest of his future success as a teacher by securing the approval of the faculty and the warmest admiration of the students.

While here, he was first seized with a passion for botany, under the inspiration of the *genius loci*, and, at once, with the possession of the merest rudiments of the science, planned and commenced a complete Flora of Switzerland, which resulted several years later in his great work, the *Historia Stirpium Helvetiæ Indigenarum*. From Basle he made excursions throughout Switzerland, crossing snows and torrents, glaciers and mountain-passes, collecting, preparing, copying, and describing what he saw, with the passionate activity which he carried into every thing he undertook. From this time his health became robust, for thus nature repays those who worship her in her sanctuaries, in forest and field, on the mountain-top

and by the resounding shore. But the Swedish star, rising to the zenith with so steady and intense a beam, eclipsed the flame which these labors had else secured.

His career of study at length completed, he returned to Berne in 1730, at the age of twenty-two, with a high reputation, valuable friendships secured, a fair knowledge of the world, and a thoroughly trained intellect, to embark upon the career of a practitioner of medicine. He now appeals to a different tribunal from those which had honored his high attainments in science, and experiences the same petty trials and disappointments which await every young practitioner who commences practice relying upon his own knowledge, skill, sagacity, and experience, for his professional advancement. He now leaves "the calm and luminous atmosphere of the schools for the stormy limbo of actual practice." His want of success is eminent. One of his biographers thus apologizes for this distinguished failure as a practitioner:—"The ignorant," he says, "who are ordinarily jealous, and care not to praise several talents in the same individual, accused him of giving too much time to theory, as if medicine were a science without principles, or as if it were a duty to ignore them and a crime to learn them." His satires, also, he says, were not forgotten. But to our view his want of success requires no strained apology. He who undertakes the practice of medicine must hold the well-being of his patients as his supreme duty and care. The public is sufficiently conversant with its own best interests, and above all with its personal safety, not to allow even the distractions of science to usurp the attention and service which it claims as its own. Haller was but a youthful practitioner, wedded to science and poetry. Under the influence of their allurements, and in the ardor for scientific fame, it would be but natural that practical duties should be deemed onerous—should be too lightly esteemed—perchance overlooked; and so, no doubt, his fellow-citizens thought. He was bitterly disappointed by his failure to secure a hospital appointment after four years of professional life in his native city; but he sought solace for this neglect in inaugurating and bringing forward some of the great works which he had planned, as, for example, the "*Commentaries on Boerhaave*," which were commenced as early as 1729, and by securing domestic felicity in wooing and winning Marianne Wys, to whom he was devotedly attached, and whom he had celebrated

in one of his finest and most popular poems, under the name of "Doris." Nor was he allowed to quit Berne without evidence of appreciation of his genius on the part of his fellow-citizens, who, although they would not trust him with their lives in sickness, erected for him an anatomical amphitheater, and gave him employment in the public library and in the arrangement of a museum of medals and coins. The publication of several monographs in anatomy and botany had given him a reputation in the scientific world, and led to a most important change in his prospects, one which, by securing a field for the exercise of his talents and wonderful industry, laid the foundation of his fame.

George the Second of England, and Elector of Hanover, had recently founded an institution of learning at Göttingen, in which Haller was offered professorships of botany, anatomy, and surgery. George the Second had come to the throne of England, in 1727, but little better acquainted than his father with the English language, and like him, also, more interested in his electoral dominion than in his kingdom, leaving the latter, according to Hallam, to be governed mainly by his ministers. Although his libertine tastes were not greatly influenced by respect for science or literature, he proved a generous benefactor of the infant university—probably the most commendable act of a shameless life.

Haller did not long hesitate to accept the proffered dignities; and bidding farewell to Berne, removed with his family to Göttingen. A sad affliction attended the very outset of his career in that city—none less than the loss of his wife, who was killed by being thrown from a carriage. In an ode to her memory, bewailing her loss, he says: "Far from all that I hold dear, from all those whom blood or friendship made worthy of affection; here, where I had only thee; here, shall henceforth be my country; here, where no friends will mourn for me, where I possess nothing but thy tomb; here shall be my own sepulchre, by thy side, whither my fate is leading me."

He now gave himself up so entirely to the duties of his chair and to his scientific labors, and with such success, that the fame of the new university spread throughout Europe, and the world marveled at his intellectual stature. The simple enumeration of the works which he published during the seventeen years of his life at Göttingen will sufficiently attest his fertility of intellect; but in addition to these, he contributed frequently to historical

and literary publications, and to the the Transactions of the Royal Society of Göttingen, of which he was one of the founders and perpetual president, and was the soul of all enterprises designed to secure honor and influence to a seat of learning now ranking among the first in Europe; honored by such names as those of Blumenbach, Siebold, the Grimms, Müller, and Mitscherlich, and still one of the most frequented by American students of all the schools of the Old World. In 1742 he completed his great work on botany, pronounced, on no less authority than that of a president of the Linnæan Society of London, "One of the most excellent and complete Floras the world ever saw." Between 1739 and 1744 appeared his "Commentaries on Boerhaave" in seven folio volumes. In 1743 appeared the first series of plates of his "Anatomical Atlas;" in 1747, his "Primaë Linææ," or text-book of Physiology. In 1751 he edited the "Methodus Studii Medici" of Boerhaave, with copious annotations. He edited also "Buffon's Natural History" in German, and published several academical discourses.

He was on terms of intimate friendship with the prime-minister of Hanover, through whose intervention he obtained for the University numerous benefactions. He was thus enabled to establish a lying-in-hospital, a botanical garden, an anatomical and surgical theater, and a school of design, with the object of perpetuating frail organic characters in natural history. By encouraging students in the thorough investigation of definite problems in medical science, and by using them as collaborators in his own researches, he secured valuable acquisitions, to which the powers of a single mind or the physical endurance of a single body would have been inadequate. Years afterward he mentions with pride the names, now distinguished, of those students whom he had thus initiated into scientific research, as Meckel, Zinn, Zimmermann, Schöbinger, Voss, Andersch, and others—names known to every student of anatomy. Amid all other pursuits, however, he kept constantly in mind and in preparation the reform in physiology, which is his greatest work and surest title to fame.

As the result of these labors, learned societies vied with each other in bestowing honors upon him. He was chosen a Fellow of the Royal Societies of Stockholm and of London, of the Academies of Paris and of Berlin. As early as 1745 he had been made a member of the Sovereign Council of Berne, to which position he was

eligible by hereditary right. At the request of George the Second, Francis, Emperor of Germany, ennobled him with the title of "Baron of the Empire." His name was honored wherever science was esteemed. He left the University at Göttingen in a full tide of prosperity, and escaped becoming a witness to the indignities which Hanover suffered during the long wars which followed the usurpations of Frederick the Great. Haller gives as his motive for quitting Göttingen that his constitution was broken down; he would have laid his bones there, he says, had not the state of his health caused him to apprehend an invalid and useless existence or a premature death through the continuance of his labors as a teacher. Other motives, doubtless, contributed to form his resolution. His salary at Göttingen had permitted him to make no provision for age or infirmity; he left his professor's chair in circumstances of as little independence as when he first occupied it; in fact the very honors which had been showered upon him made his narrow income more manifest and more uncomfortable. No wonder, therefore, that when he found his native city eager to welcome him—proud, now, of the distinction which he conferred upon her, and holding out to him lucrative offices and a share in the government, and appealing to the mountaineer's love of home—that he was found willing to exchange the level plains of the Leine for the ramparts of the Aar. Overtures were made to him by the King of England to accept the Chancellorship of the University at Göttingen; by the King of Prussia was offered him that of Halle; the Czar proposed to him a lucrative appointment at St. Petersburg; Oxford offered him the chair of Dillenius; but Switzerland held him for the remainder of his days. When he left Hanover he was in the prime of manhood, and his return to Berne was by no means a retirement from active life, nor a renunciation of his now commanding influence. His studies were not intermitted, and as a legislator and ruler his clear intellect and weight of character afforded ample opportunity for beneficent activity.

The Grand Council of Berne, in which Haller now took his place, which exercised sovereign authority in the Canton, was composed of 299 members chosen from a certain number of families, and, according to Burke, Berne was the "best governed commonwealth on the face of the earth." A senate, consisting of twenty-seven members, was invested with more immediate

authority; it was chosen from the Grand Council. The Canton was divided into a certain number of districts or bailiwicks, over each of which was a governor who enforced the laws and administered justice. As these posts were very honorable and profitable, they were much coveted. The governor resided in a fine mansion, exercised undisputed sway, and received imposts, fines, and perquisites, enabling him to accumulate in the six years, to which the tenure of the office was limited, a considerable fortune. One of these, the government of Aquileia and directorship of the salt mines of La Roche, was assigned to Haller. His administration was blameless; under his direction the price of salt—a commodity of great importance in a pastoral community—was lessened, and its quality improved; but he by no means renounced his physiological studies. Debarred from the prosecution of anatomy, he turned his attention to experimental physiology, experimenting on living animals to an extent which, he says, he is afraid to indicate lest he should be accused of boasting. It was during this period mainly that the “*Elementa Physiologiae*” was composed, the eighth volume appearing in 1766, two years after the expiration of his term at La Roche, and eleven years before his death. This was the *magnum opus* of his life. His botanical system was superseded by that of Linnæus; his textbooks have been left far behind in the march of science; the stores which his erudition amassed are ransacked for learned consultation only; his poetic effusions are pale beside the glowing colors in the gardens of later florists; but in the recognition of the properties of the tissues, of the independent endowments of the different elements which constitute the animal fabric, involved in his doctrine of irritability and sensibility as properties of matter, he gave an impulse to physiology, which, re-enforced by Bichat, and by the leaders of modern science, and by the systematic study of the properties of the tissues in living animals, is changing the character of medical knowledge, and placing its method and laws side by side with the experimental sciences in certainty and capacity of sure progression. On this subject I shall be excused for dwelling at some length, not only in order to determine the extent of Haller’s claim on our gratitude, but because it is of the first importance that the direction in which medicine is progressing, and in which alone it can progress, should be recognized; in order that we may lend our encouragement and

influence where they will be of most avail ; that we may not be distracted by the innumerable false lights which self-interest is constantly waving frantically before the eyes of the profession ; in order that mere instruments and drugs, inflated by the venal commendation of manufacturers, may not occupy for us too large a space on the horizon of medical knowledge ; in order that we may not mistake ripples of local influence and the splashing of schools, whose only motive of existence is in dividends, not ideas, for the tide-wave of medical progress ; in order that we may not be misled by endeavors, however otherwise respectable or widely associated, to flatter mediocrity, dignify quackery, and afford valetudinarian exercise to scientific and literary infirmity ; and that, finally, we may be well determined in our minds what treatment we ought to bestow upon those who set themselves directly athwart medical progress, thus legitimating our righteous intolerance of their influence.

The aim of all medical research is the attainment of sure prevision of the results of disease, and of the effect of remedies ; the certain recognition, in every case brought under medical observation, of its course and termination under given conditions, and a precise knowledge of the results of treatment. The human system is a little world or microcosm within the world of nature, and, to a degree, independent of it, having its own attractions and repulsions, its periods and cycles, and its own laws, as immutable as those which keep the planets in their orbits. Disease cannot introduce into the system new laws ; there is but one science of life, whether in health or disease ; but the elements of the body are numerous, they are bound together in delicate adaptation to the wants of the whole organism. Hence the problems which disease presents are complex ; hence the appearance, but appearance only, of uncertainty in the operations of vital laws. Attempts to disentangle them have been inadequate, which have not been brought to bear upon the elements, and it is only recently that these have been fairly recognized. The planet Leverrier was pointed out by the perturbations of Uranus ; in the human organism we have neglected the elements and tissues, the planets and systems, of the human firmament. Haller's great work was a protest against this mode of study, and the indication of the true basis of medical knowledge, and the true direction of

medical progress. He first brought order out of chaos. By recognizing that sensation and motion are properties, not of the entire body, but of definite parts of it; that contractility belongs exclusively to muscular fibre, and sensation to nervous tissue, life was no longer regarded as an inexplicable unity, but as the sum of the endowments of the constituent parts of the organism, its science having, like every other science, its ultimate inexplicable facts, but now the subject of scientific analysis.

To know that carbonic oxide gas (a poison with which every house is liable to be tainted) produces certain symptoms, and even death when largely administered, is but superficial knowledge; but to know that these symptoms and death are the result of a paralysis of the blood-disks, by which they are rendered inert in hamatosis, is to possess an intelligent acquaintance with the matter; is to have translated a hieroglyphical sentence into the language of the human organism.

To know that a temperature of 115° Fahrenheit is fatal to the human body, is no very important acquisition; but to know that it is fatal because that temperature of the blood paralyses the entire muscular tissue of the body, is to have found the elements by which alone the vital problem can be solved.

The simple discovery of albumen as a pathological product of secretion, with the easy tests by which it is recognized, has done more to give precision to the diagnosis of what before was obscure disease than any discovery since that of auscultation. But it is not enough to watch the doors of a house in order to know what is going on within. We must explore its penetralia, measure its stores of vital force, find out how its fires are put out, and where the storms beat in, and watch the riot in blood and nerves. Vital statistics and nosological systems cannot answer our inquiries, for these but watch the human tenements from afar. Every cause of disease must be traced to its effect on the life of each tissue; likewise, every medicine administered must be followed throughout the system. Here there is still a *terra incognita*. The source of fibrin is not yet certainly known; the sources of animal heat and muscular power are still in dispute; it is not settled whether nerve force and electricity are identical; the glycogenic function of the liver, the production of diabetes by wounding the medulla oblongata, and of epilepsy, by section of the spinal cord, still stand as isolated landmarks in physiology and pathology, instead

of being understood as the natural sequences of well established vital laws. This then, I argue, is the direction in which we should labor; not in multiplying observations of outward symptoms, but in tracking the derangements of the body to their seat in its most secret recesses, and learning their hidden nature; in studying atomic combinations and decompositions, and the accompanying liberation or repression of the forces of life. What a field is here offered for conscientious toil or enthusiastic activity, or, rather, what motive for the consecration of a life to labor. With such aims, a soul is given to what, without them, is lifeless routine. Outward signs and symptoms are and have long been sufficiently studied and expounded; true progress now consists in sounding the depths of life, in learning the laws which prevail in the laboratory of forces and transmutations *beneath the surface* which separates the outward world from the inner world in man. We can no longer be content with catalogues of symptoms and appearances; we must have the life, the law, the truth, the reality, beneath the appearances.

I leave you to determine, as a corollary from the foregoing, how large a share those branches of medical science, which have for their object the promotion of this kind of knowledge (as General Anatomy, Anatomical, Physiological, and Pathological Chemistry, and Experimental Physiology and Pathology), should have in a thorough medical education.

Furthermore, all the unfortunate divisions and strifes, by which practical medicine is afflicted and thwarted of its highest aims, are possible, only by ignoring the scientific point of view. There can be no doubt that, under the sway of science, the most fraternal feeling will ultimately pervade the whole body of practitioners. Let us hope for its speedy realization.

With what tolerance, think you, a Herschel, a Newton, or a La Place, would have heard of astronomical sects, of an eclectic, homeopathic, or clairvoyant astronomy; or a Faraday, a Brewster, a Tyndall, of eclectic, homeopathic, clairvoyant, and mesmeric physicists; or a Lavoisier, a Davy, a Liebig of clairvoyant, homeopathic, or eclectic chemistry? Sound practical medicine is the admission of demonstrated scientific principles to the control and direction of the medical art. When the movement inaugurated by Haller shall have borne its rich and abundant fruit, medical sects will have passed into oblivion, and the terms eclectic, clair-

voyant, and homeopathic practitioners will only excite a smile at the vagaries of the past, for there is and can be but one science of life, of which the true physician must be the minister.

I cannot dwell longer on this theme, important as it is. I have but indicated what appears to me to be Haller's chief claim on our gratitude, and the bearing of his doctrines of irritability and sensibility, as properties of animal matter, upon the advance of Physiology.

One who enters upon the study of Haller's "Elements," will be struck at the outset with the clear vision manifested on the subject of the resources and means of advancement of the science. The preface would not be out of place in the most modern treatise on Physiology; it is matchless in its clear scientific insight and in beauty of language. The name of Bacon in the first line of the work places it under the banner of the Baconian philosophy—the philosophy of utility and of progress. He had found a better guide than Descartes, the hero of his boyish admiration.

He says, "I am so utterly opposed to those cloud-builders (who would divorce Physiology from Anatomy), that I am persuaded that we know scarcely anything of Physiology that is not learned through Anatomy." "To have gone over the whole body, and to have studied all its regions thoroughly, is as rare and as difficult as a full history of all the cantons, all the rivers, valleys, and hills of an immense region. Life is short; shorter still is that of the Anatomist, which either death cuts short, or another career interrupts, or at least other duties of civil life disturb. It can be shown, even by positive calculation, that is not possible in twenty years to work out thoroughly all the parts of the human body."

"Animals must be dissected, but it is by no means sufficient to dissect their dead bodies; they must be vivisected. In a dead body motion is wanting. It is necessary, therefore, if we would witness motion, to observe the living animal. But the whole of Physiology is occupied with the external and internal movements of the living body. Therefore, to investigate the circulation of the blood and its more subtle motion, to understand respiration, the growth of the body and the bones, the vermicular movement of the intestines, and the course of the chyle, it is absolutely necessary to sacrifice living animals. A single experiment has often refuted the laborious fictions of whole years. This cruelty

has done more for true Physiology than nearly all other methods, by the combined employment of which our science has progressed."

He shows the value of Pathological Anatomy to Physiology, and thus speaks of the employment of the microscope:—"Again, since there are minute divisions and elements in which that molecular activity takes place which constitutes the whole of Physiology, and since our eyes are created for the common offices of life, and for seeing from afar that which tends to bodily safety or hurt, it is necessary to arm them with the microscope, that we may study these minute divisions."

"*Chemia species quædam est Anatomies*," Chemistry is a kind of Anatomy, a truth on which Robin and Verdeil founded their great work on Anatomical Chemistry, which has marked an epoch in our science.

The work is full of such gems as this:—"Natura sola nova est sola fida, nunquam salis colitur, nunquam frustra." I know not whether most to wonder at these intuitions, or admire the beauty of their setting.

In every portion of the body Haller either made anatomical discoveries, or took the lead in close and accurate description. He tested every portion of the animal organism with reference to its sensitive or motor endowments. His erudition enabled him to pour a flood of light upon questions of physiological function. No opinion so obscure, no gem of truth so hidden among scientific rubbish, that it did not find a place on the pages of his great work. To this day even a branch of Physiology can hardly be said to be wrought out unless note is taken of the treatment bestowed upon it by our author. In the discovery of the development of the heart and of the fœtal circulation, and of the continuance of the circulation after the cessation of the heart's action, he rounded and filled out Harvey's work. By his treatise on monstrosities, he laid, according to St. Hilaire, the foundation of the science of Teratology. He found Physiology a tissue of fictions, a pseudo-science like the Phrenology, Biology, and Animal Magnetism of the present day, in disrepute among the learned, on account of its slight basis of demonstration and its extraordinary assumptions. In raising it from its low estate and giving it rank among the sciences, he justly earned the title of the "Father of Physiology."

There is abundant evidence that Haller had stimulated his ambition and directed his studies by the example of Conrad Gesner, of Zurich, at that time pronounced the first naturalist the world had seen since Aristotle. One of Gesner's descendants was his most intimate friend; the example was too near not to have aroused emulation in one whose talents gave him so fair a prospect of succeeding to the brilliant inheritance of Gesner's fame. The infinite variety of nature summoned into exercise all his powers; their exercise was in him that of a strong man rejoicing in his strength; toil was a pleasure; great results were accomplished with ease; his work was such as others could share, an advancing, social, natural, encyclopædic; he sought no isolation in which facts should be tortured into giving up their laws; he sought no Egerias for retired communion with the shy spirits of nature; the law beneath the appearances, or the law within the law, did not fret his imagination; he would never have sought for the philosopher's stone or elixir of life with crucible and alembic; fond of the light, he was unwilling to grope in any darkness; he sought in the light only the power "which made the darkness and the light and dwells not in the light alone."

These are a part of Haller's scientific and intellectual glories; his social and religious character and influence also demand recognition.

There can be no doubt of the sincerity of his religious convictions, of the purity of his life, and the wide range of his Christian benevolence.

After his return from Göttingen he was made a member of the Supreme Consistory, the highest religious tribunal of the reformed church in the Canton of Berne. Through his influence the salaries of the clergy of the Pays de Vaud were increased, and he was charged with the distribution of the funds appropriated for that purpose.

He published several works of religious instruction. Among these his *Letters to his Daughter, on the Evidences of Christianity*, has been highly praised, not so much for its literary merit as for responding to the wants of one who is seeking in earnest reliable solutions of the problems of the Christian faith.

He published also a reply in detail to all the arguments with which Voltaire had attacked *Holy Writ*. The Reformation had ceased to make conquests; the Church of Rome continued regaining the ground she had lost until a final blow was given to her empire by

Voltaire, Rousseau, and the incendiaries who lighted the fires of the French revolution. The teaching and authority of Rome were pierced through and through by the envenomed shafts hurled from Ferney and Geneva. Voltaire spared nothing sacred in the vindictiveness of his assaults upon the gloomy terrors of inquisitorial superstition. Haller sought to save the truths of the reformed religion from being confounded with the superstitions in the destruction of which he and Voltaire were collaborators. The French revolution spared neither; the Italian revolution of '48, its legitimate offspring, drove the Pope into exile; and he now awaits the fate of his sovereignty at the hands of an united Italy.

Haller's earnestness and Voltaire's mocking spirit could but be at constant enmity, nor was their animosity assuaged by such occurrences as the following: Voltaire, learning that the Emperor of Austria was about to pay him a visit at Ferney, had the conceit to assemble a concourse of his admirers to witness the honors about to be paid him by so august a personage. The Emperor, learning the fact, and willing to mortify the cynic's vanity, turned aside from Ferney and sought out his rival, spending hours in his society, and afterward praising loudly his erudition, paying imperial tribute to his fame.

To Haller's chagrin, his doctrine of irritability and sensibility, as properties of tissue, was caused to assume an irreligious aspect, and to lend support to the grossest materialism. Lanetterie, a French physician and author of celebrity, in a work entitled "*L'homme Machine*," thanks Haller for his most powerful arguments, and pretends to shelter his irreligious doctrines under Haller's sanction; but Haller's sanction was far from following these merely logical and purely material results of his teaching. He announced in the "*Journal des Savans*" that he could hold no fellowship with the author of such impieties.

A strange inconsequence is seen in Haller's advocacy of the doctrine of "inclusion of germs" in explanation of the transmission of vital endowments—a doctrine contrary to the very principles which it was his glory to have developed. He seriously expresses the conviction that the body of Eve contained the infinitely minute miniatures of all her descendants, which became by transmission and development all the generations by which the earth has been peopled. It is to be feared that he

was led to this absurd and now exploded doctrine through supernatural rather than natural considerations. It would have been wiser to have remembered the teaching of Bacon, that "not only fantastical philosophy, but heretical religion spring from the absurd admixture of things divine and human. It is, therefore, most wise soberly to render unto faith the things which are faith's."

It is not often that the practitioner of medicine has the opportunity of bringing before the world convincing proofs of superior judgment and ability in the exercise of his profession; far oftener inevitable death mocks all the resources of science and of practical skill. Such an opportunity, however, occurred to Haller in treating with marked success an epidemic of bilious pleurisy, which prevailed in the canton of Gruyère, in the management of which he dispensed with bleeding, contrary to the universal custom in the management of this disease, thus manifesting his superiority to routine and anticipating the recent advances in therapeutics. That is an unpardonable misconception which regards our most judicious physicians as wedded to the administration of potent drugs, and to the practice of unnecessarily heroic or perturbing treatment. In spite of theories and prejudices, dogmas and traditions, Rational Medicine has had her true disciples in all ages, and she alone is ready with adequate resources of relief when firmness and decision are demanded in order to rescue an imperilled life.

According to Ruskin, "science and poetry are to a nicety diametrically opposed, and he must be a Shakespeare and Newton, a Turner and Faraday, all in one, who can consort much with both without injury to each." There is undoubted truth in this assertion, it would be hard to bring forward examples of distinguished names in science which are known also to poetic fame. Haller's poetry was the offspring of his youthful enthusiasm, of his religious temperament, of the spring-time of his love for Doris and friendship for Gesner, of the period when metaphysics had not lost their charm, and he preferred Descartes to Bacon. His poetry is marked by simplicity, purity, and love of truth and nature. No wonder that the last of these should have constituted a predominant element in his organization. The waters which washed the walls of Berne told him of their source amid the eternal silence and solitary grandeur of the shining mountain-top, amid the roar of the avalanche and thunders of rock-

freighted glacier; amid torrents falling like a "downward smoke," retransmuted into mist by sheer descent, or in their rage dragging the mountain to the plain; amid gleaming pines far above the rifts of lofty clouds; amid the rosy light which departing day leaves on the snows above the deepening shadows of the valleys; amid storm-echoes, as the lightning shatters the ragged peaks; amid the marvelous tints of the flowers which bloom in the pure ether by the edge of eternal snows. There are no scenes that I recall so full of pure enjoyment as when I wandered free among these same mountains. I well remember how the bounding pulse answered the eyes which caught for the first time their glories from the summit of the Juras; and how eyes filled with unbidden tears when they took their farewell look at their friendly forms.

The following translations will give an idea of the character of Haller's poetry.*

Notwithstanding the absence of imagination and the almost prosaic simplicity with which nature is described, problems of philosophy stated, virtue encouraged, and ambition, superstition, luxury, and vice reprehended, his poems had a remarkable popularity; twenty-two editions were successively called for, and they were translated into all the languages of Europe.

Haller's advanced years were a marked contrast to his enthusiastic, joyous, poetic youth. In his old age he became morose, subject to seasons of irritability. Toward his family he was stern and exacting. He was querulous under the opposition with which some of his opinions were met; he complained of the injustice of Albinus, while his own intolerance of Linnaeus was far less defensible. In his *Bibliothecæ*, or *Encyclopedias* of Botany, Anatomy, and Practical Medicine, he makes a scale of merit of living authors, assigning to them the position and authority which each possessed in Haller's estimation. By so doing he naturally aroused the animosity of those whom he had rated below their own estimate of their authority and dignity, and furnished an indication that his erudition had been amassed at the expense of some of the finer feelings of his nature. He who once placed man's highest development in the cultivation of true and beautiful sensibility, had forgotten his own best teachings.

* These were extemporized translations of his Ode to the Alps, and of his First Satire.

He often spent weeks together in his library. A broken right arm did not cost him a day. The day following the accident his medical attendant found him practicing in writing with his left.

In addition to the *Bibliothecæ*, in which every author in the sciences mentioned in every classic and modern language was epitomized, he composed three political romances, entitled "Usong," "Alfred," and "Fabius and Cato." To the first of these only I have had access. If the other two are not superior to this they can scarcely be said to have added to his fame. They were published between 1771 and 1774. In "Usong," a virtuous, despotic monarch, is imagined among the nomads of Asia. The want of imagination in this romance, and its unmitigated morality, are in striking contrast to the opportunities afforded by a realm of oriental fancy. In "Alfred" a limited monarchy is portrayed, and in "Fabius and Cato" an aristocracy, to which last he gave the preference. The American Revolution, the first in a series of successful struggles for popular government, did not begin until the year before Haller's death. He did not survive to see Switzerland overrun by the armies of republican France, and to witness the overthrow of that government which had been the source of so many blessings to his native land. It was in fact the treasure which a prudent administration had accumulated in the vaults of Berne which led to this wanton outrage.

Haller died December 12, 1777. The calmness with which he met death is celebrated. He noted the symptoms of his disease with scientific appreciation of their meaning, and, as he neared his end, steadily observing the state of his pulse until it ceased to beat, he exclaimed to his physician, "Mon ami; l'artère ne bat plus" (The pulse is gone), and composed himself for the final moment.

Within a period of eight months Europe lost Bernard de Jussieu, Haller, Linnæus, Voltaire, and Rousseau; never within so short a period did science and literature suffer so great loss. What an opportunity these names afford for lauding the tendencies of science and of the devout study of God's works above those of literature, and the pursuit of the vagaries of the imagination.

I am unwilling to close here; there are many points on which injustice is done to Haller's memory by silence, but I have already

occupied your attention too long ; and yet not without an apology for so doing. To no class of men is the heritage of honored names so precious as to physicians. No bright goal awaits the physician's most successful endeavors ; there are no titles, honors, or brilliant fortunes, to which he can aspire ; he is forbidden to court notoriety ; the only distinction among his fellows which is well earned, is that of more unwearying and more intelligent devotion to the prevention and relief of human suffering ; the world feebly commends his success, although it cruelly condemns his failure ; not by immense multitudes or applauding shouts are his services recognized, but by the tear of silent gratitude, oftenest only by the voice of an approving conscience. But this isolation has its dangers. As it removes the stimulus of ambition, and precludes a tribunal of public accountability, by so much the more necessary is it that the physician should warm his generous impulses, and keep himself steadfast to his highest professional aims, by striving to imbibe the spirit and follow the example of the great and good whose names are written highest on our roll of honor.

